

**Amendments to the Claims:**

This listing will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Currently amended): A method ~~to prepare for preparing~~ a microporous outside-in PVDF hollow fiber membrane which is spinned by immersion and coagulation, which method comprises the steps of:

a. preparing polymer solution by introducing the following material into a mixer, dissolving and stirring the resulting solution: it at a certain temperature:

Polyvinylidene Fluoride 18-25%(wt);

Organic additives 22-25%(wt);

Inorganic additives 0.5-5.0%(wt);

Solvent 59.5-45.0%(wt).

b. extruding the said solution obtained in step a through an outer tube of a double tube spinneret, and a lumen forming composition liquid through an inner tube of the double tube spinneret same simultaneously;

c. obtaining original a fiber membrane by introducing and immersing the extruded polymer solution as well as the lumen forming composition liquid into a first stage coagulation bath, and consequently into a second coagulation bath after quick evaporation, wherein a precipitation takes place via phase inversion in the said two baths respectively;

d. passing the original fiber membrane from step c through a rinsing bath, subjecting it bath so as to subject the fiber membrane to hydrophilic rendering; rendering and produce then an outside-in hollow fiber with double skins and complete spongy network, is prepared.

Claim 2 (Currently amended): The method of claim 1, wherein the said organic additives ~~consists~~ comprises of at least ~~two~~ one of the ~~groups~~ of polyvinylpyrrolidone, polyethylene glycol, polyvinyl alcohol, Tween and Triton. ~~Triton; If the additives are more than two kinds, the total amount is constant.~~

Claim 3 (Currently amended): The method of claim 1, wherein the said inorganic additives is ~~selected~~ comprises at least one of ~~from the group comprising~~ lithium chloride, lithium nitrate and sodium acetate solution. ~~solution; If the additives are more than two kinds, the total amount is constant.~~

Claim 4 (Currently amended): The method of claim 1, wherein the said solvent ~~is selected~~ comprises at least one of ~~from the group comprising~~ N-Methyl Pyrrolidone, dimethylformamide, dimethylacetamide, dimethyl sulfoxide and triethyl phosphate. ~~phosphate; If the solvent is more than two kinds, the total amount is constant.~~

Claim 5 (Currently amended): The method of claim 1, wherein the said lumen ~~forming~~ forming liquid comprises ~~comprising~~ 10-80% by weight of a solvent ~~for~~ of PVDF, 5-30% by weight of alcohol and polyalcohol, 0.5-5% by weight of a surfactant and ~~ether is a balance of~~ deionized

water.

Claim 6 (Currently amended): The method of claim 1, wherein the molecular weight ( $M_w$ ) of the polyvinylidene fluoride resins ~~ranges~~ range from 400,000 to 800,000 daltons, and the a characteristic viscosity of the polyvinylidene fluoride resins range ~~ranges~~ from 1.65-2.00.

Claim 7 (Currently amended): The method of claim 1, wherein the characteristic viscosity for the ~~said~~ PVDF resin is 1.75-1.85, and the molecular weight of the ~~said~~ PVDF resin is 500,000 to 700,000 daltons. ~~Dalton; if there is more than one kind of PVDF, the total amount is constant.~~

Claim 8 (Currently amended): The method of claim 1, ~~or 2 or 3 or 4 or 5 or 6 or 7~~, wherein the ~~said~~ organic additive is polyvinylpyrrolidone, having a molecular weight ranging from 11,000 to 1,000,000 daltons. ~~daltons, and the concentration for the said organic additive is 22-25% (wt).~~

Claim 9 (Currently amended): The method of claim 1, ~~or 2 or 3 or 4 or 5 or 6 or 7~~, wherein the evaporation time ~~is preferably ranging~~ ranges from 0.02s to 0.2s; the ~~said~~ first stage coagulation coagulating bath ~~preferably~~ comprises 40-80% by weight of a solvent for of PVDF resin and the immersion ~~in which the time in the first stage of coagulation bath~~ is 1.5s to 4.0s; and the ~~said~~ second stage coagulating bath ~~preferably~~ comprises 40-80% by weight of a solvent of PVDF resin ~~in which the and the immersion time of in the second stage coagulation bath~~ is 4.0s to 120s.

Claim 10 (Currently amended): The method of claim 1, ~~or 2 or 3 or 4 or 5 or 6 or 7~~, wherein the

~~said a hydrophilic agent is used in step d which selected comprises at least one or more from the group comprising 10-80% by weight of propanetriol, 0.05-5% by weight of hydroxypropyl cellulose and 0.5-5% by weight of Triton.~~

Claim 11 (Currently amended): The method of claim 8, 14, wherein ~~a the said~~ hydrophilic agent is used in step d which comprises is selected at least one or more from the group comprising 10-80% by weight of propanetriol, 0.05-5% by weight of hydroxypropyl cellulose and 0.5-5% by weight of Triton.

Claim 12 (Currently amended): The membrane of claim 1, ~~or 2 or 3 or 4 or 5 or 6 or 7~~, wherein the ~~said~~ hollow fiber has double skins which are internal and external and a complete sponge network supporting layer in the cross-section; wherein the external skin is denser than the internal skin, one; the microporous hollow fiber membrane has an average pore diameter ranging from 0.01 $\mu$ m to 0.06 $\mu$ m, and a water flux per unit wall thickness of 150 to 800L/m<sup>2</sup> h (at 25°C, 1bar), a 800L/m<sup>2</sup>.h.25°C.1bar, porosity of 70-85%, and a compressive strength of more than 0.5Mpa.

Claim 13 (Currently amended): The membrane of claim 8, 14, wherein the ~~said~~ hollow fiber has double skins which are internal and external and a complete sponge network supporting layer in the cross-section; wherein the external skin is denser than the internal skin, one; the microporous hollow fiber membrane has an average pore diameter ranging from 0.01 $\mu$ m to 0.06 $\mu$ m, and a water flux per unit wall thickness of 150 to 800L/m<sup>2</sup>h (at 25°C, 1bar), a 800L/m<sup>2</sup>.h.25°C.1bar,

porosity of 70-85%, and a compressive strength of more than 0.5Mpa.

Claim 14 (New): A method for preparing a microporous outside-in PVDF hollow fiber membrane which is spinned by immersion and coagulation, which method comprises the steps of:

- a. preparing polymer solution by introducing the following material into a mixer, dissolving and stirring the resulting solution:

Polyvinylidene Fluoride	18-25%(wt);
Organic additives	22-25%(wt);
Inorganic additives	0.5-5.0%(wt);
Solvent	59.5-45.0%(wt)

wherein the molecular weight of the polyvinylidene fluoride ranges from 400,000 to 800,000 daltons and the polyvinylidene fluoride has a characteristic viscosity that ranges from 1.6 to 2.0 ( $10^2$ ml/g, 30°C);

- b. extruding the solution obtained in step a through an outer tube of a double tube spinneret, and a lumen forming composition liquid through an inner tube of the double tube spinneret simultaneously;

- c. obtaining a fiber membrane by introducing and immersing the extruded polymer solution as well as the lumen forming composition liquid into a first stage coagulation bath, and consequently into a second coagulation bath after quick evaporation, wherein a precipitation takes place via phase inversion in the two baths respectively;

- d. passing the fiber membrane from step c through a rinsing bath so as to subject the

fiber membrane to hydrophilic rendering and produce an outside-in hollow fiber with double skins and complete spongy network.

**Claim 15 (New):** The method of claim 14, wherein the characteristic viscosity for the PVDF resin is 1.75-1.85, and the molecular weight of the PVDF resin is 500,000 to 700,000 daltons.

**Claim 16 (New):** The method of claim 14, wherein the organic additives comprises of at least one of polyvinylpyrrolidone, polyethylene glycol, polyvinyl alcohol, Tween and Triton.

**Claim 17 (New):** The method of claim 14, wherein the organic additive is polyvinylpyrrolidone, having a molecular weight ranging from 11,000 to 1,000,000 daltons.

**Claim 18 (New):** The method of claim 14, wherein the inorganic additives-comprises at least one of lithium chloride, lithium nitrate and sodium acetate solution.

**Claim 19 (New):** The method of claim 14, wherein the solvent comprises at least one of N-Methyl Pyrrolidone, dimethylformamide, dimethylacetamide, dimethyl sulfoxide and triethyl phosphate.

**Claim 20 (New):** The method of claim 14, wherein the lumen forming liquid comprises 10-80% by weight of a solvent for PVDF, 5-30% by weight of alcohol and polyalcohol, 0.5-5% by weight of a surfactant and a balance of deionized water.

Claim 21 (New): The method of claim 14, wherein the evaporation time ranges from 0.02s to 0.2s; the first stage coagulation bath comprises 40-80% by weight of a solvent for PVDF resin and the immersion time in the first stage coagulation bath is 1.5s to 4.0s; and the second stage coagulating bath comprises 40-80% by weight of a solvent of PVDF resin and the immersion time in the second stage coagulation bath is 4.0s to 120s.